WILLIAMSON ORCHARD (PWS # 3140236)
SOURCE WATER ASSESSMENT FINAL REPORT

March 27, 2005

State of Idaho
Department of Environmental Quality

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Executive Summary

Under the Federal Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. The Idaho Department of Environmental Quality (DEQ) is completing the assessments for all Idaho public drinking water systems. The assessment for your particular drinking water source is based on a land use inventory within a 1,000-foot radius of your drinking water source, sensitivity factors associated with the source, and characteristics associated with either your aquifer or watershed in which you live.

This report, *Source Water Assessment for Williamson Orchard: Public Water System (PWS) #3140236* describes the public drinking water system, the associated potential contaminant sources located within a 1,000-foot boundary around the drinking water source, and the susceptibility that may be associated with any associated potential contaminants. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this system. **The results should <u>not be</u> used as an absolute measure of risk and is not intended to undermine the confidence in your water system.**

The Williamson Orchard drinking water system consists of two wells. The system serves approximately 25 people through 3 connections.

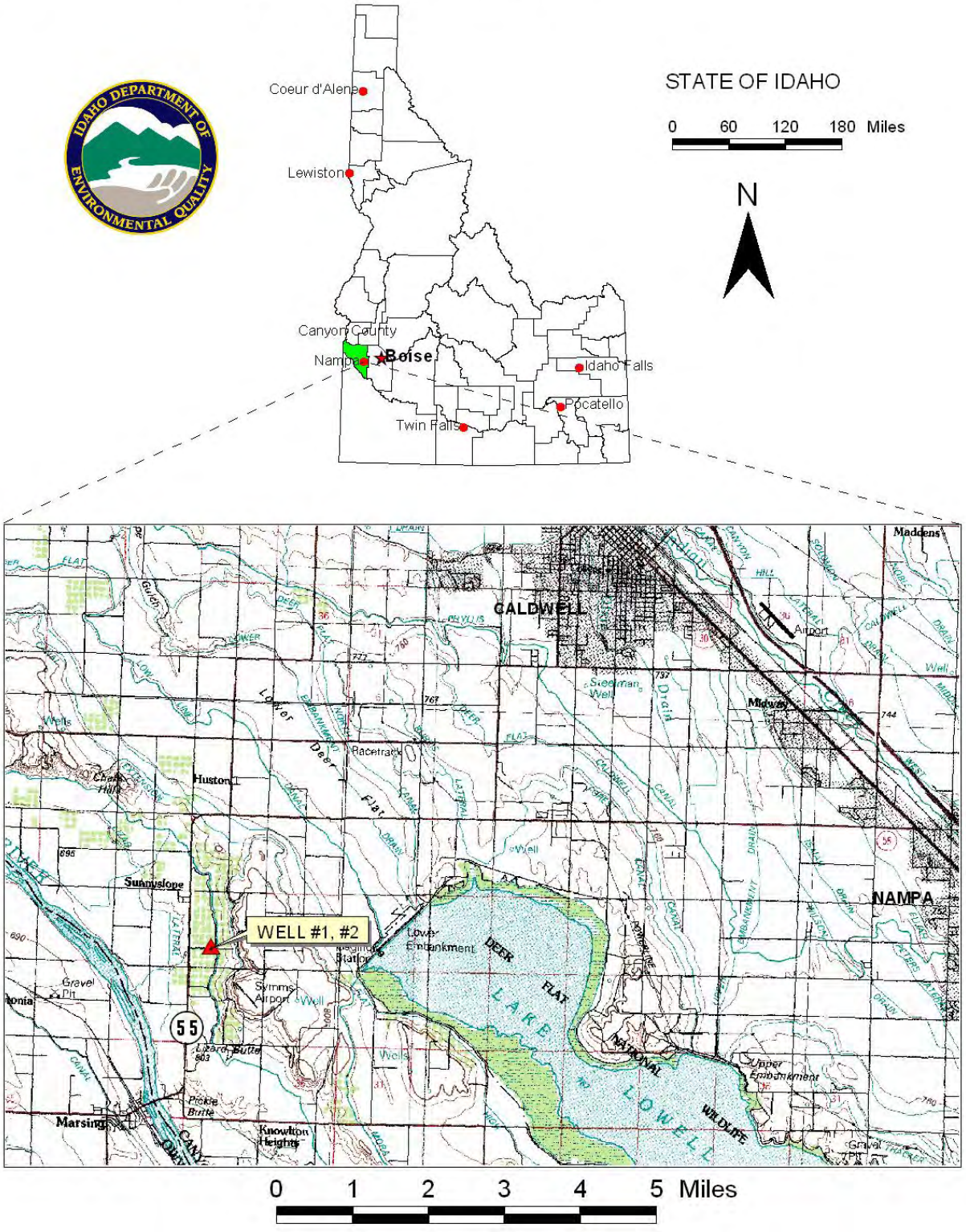
Final susceptibility scores are derived from System Construction scores, Hydrologic Sensitivity scores, and Potential Contaminant/Land Use scores. Potential Contaminants/Land Uses are divided into four categories, inorganic contaminants (IOCs, i.e. nitrates, arsenic), volatile organic contaminants (VOCs, i.e. petroleum products), synthetic organic contaminants (SOCs, i.e. pesticides), and microbial contaminants (i.e. bacteria). As different wells can be subject to various contamination settings, separate scores are given for each type of contaminant.

In terms of overall susceptibility, Well #1 rated high for IOCs and microbial contaminants, and automatically high for VOCs and SOCs. The automatic high susceptibility ratings are due to an underground fuel storage tank existing within 50 feet of the well (Sanitary Survey 2004). System construction and hydrologic sensitivity rated high. Land use rated moderate for IOCs, VOCs, SOCs, and microbial contaminants.

In terms of overall susceptibility, Well #2 rated moderate for IOCs, VOCs, SOCs, and microbial potential contaminants. System construction and hydrologic sensitivity rated moderate. Land use rated moderate for IOCs, VOCs, SOCs, and microbial contaminants.

No VOCs, SOCs, or microbial contaminants have ever been detected in tested water. Water tests have detected nitrates in concentrations of 4.24 parts per million (ppm), significantly less than the EPA's maximum contaminant level (MCL) of 10 ppm. The well exists within a priority area for the IOC nitrate and arsenic, however has not yet been a concern for this system.

FIGURE 1 Site Vicinity Map of Williamson Orchard



Based on the initial computer generated contaminant source inventory conducted by DEQ, there are four potential contaminant sources located within the 1,000-foot boundary. This information has been summarized and included in Table 1. A copy of the susceptibility analysis worksheet for your system along with a map showing any potential contaminant sources is included with this summary.

Table 1. Williamson Orchard, Potential Contaminant Inventory

SITE #	Source Description[1]	Source of Information	Potential Contaminants[2]
1	Underground Storage Tank	2004 Sanitary Survey	VOC, SOC
	Canals	GIS Map	IOC, VOC, SOC, Microbials

[2]IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Susceptibility Analysis

The water system's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

The hydrologic sensitivity of a well is dependent upon four factors: the surface soil composition, the material in the vadose zone (between the land surface and the water table), the depth to first ground water, and the presence of a 50-foot thick fine-grained zone above the producing zone of the well. Slowly draining soils such as silt and clay typically are more protective of ground water than coarse-grained soils such as sand and gravel. Similarly, fine-grained sediments in the subsurface and a water depth of more than 300 feet protect the ground water from contamination.

The hydrologic sensitivity rated high for Well #1. Regional soil data indicates the presence of moderately- to well-drained soils surrounding the well bore, and the water table was 77 feet below ground surface (bgs), according to the sanitary survey. In addition, points were added to the hydrologic sensitivity score because the well log was not available during this analysis, so vadose zone composition and whether an aquitard is present above the producing zone is unknown.

The hydrologic sensitivity rated moderate for Well #2. Regional soil data indicates the presence of moderately- to well-drained soils surrounding the well bore. The well log indicates that the vadose zone is composed of predominantly permeable materials, the water table is less than 300 feet bgs, and that an aquitard is present above the well's producing zone.

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. System construction scores are reduced when information shows that potential contaminants will have a more difficult time reaching the intake of the well. Lower scores imply a system is less vulnerable to contamination. For example, if the well casing and annular seal both extend into a low permeability unit, then the possibility of contamination is reduced and the system construction score goes down. If the highest production interval is more than 100 feet below the water table, then the system is considered to have better buffering capacity. If the wellhead and surface seal are maintained to standards, as outlined in sanitary surveys, then contamination down the well bore is less likely. If the well is protected from surface flooding and is outside the 100-year floodplain, then contamination from surface events is reduced.

Well #1 rated high susceptibility for system construction. According to the National Resource Conservation Service (NRCS), the well is outside of a 100-year floodplain. The 2004 Sanitary Survey indicates that both the wellhead and surface seal have deficiencies. Because a well log was not available during this analysis, it is unknown if the highest production comes from more than 100 feet below static water depth, if the annular seal and casings extend into low-permeability units, or if the 14-inch casing thickness meets current construction standards.

Well #2 rated moderate susceptibility for system construction. According to the National Resource Conservation Service (NRCS), the well is outside of a 100-year floodplain. The 2004 Sanitary Survey indicates that both the wellhead and surface seal are maintained. The well log indicates that although the casing and annular seal extend into low permeability units, the highest production comes from less than 100 feet below static water depths.

The Idaho Department of Water Resources *Well Construction Standards Rules* (1993) require all Public Water Systems (PWSs) to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works* (1997) during construction. Some of the requirements include casing thickness, well tests, and depth and formation type that the surface seal must be installed into. Table 1 of the *Recommended Standards for Water Works* (1997) lists the required steel casing thickness for various diameter wells. Fourteen-inch wells require a thickness of 0.375-inches. Eight-inch diameter wells require a casing thickness of at least 0.322-inches. Well tests are required at the design pumping rate for 24 hours or until stabilized drawdown has continued for at least six hours when pumping at 1.5 times the design pumping rate. Because both wells do not meet all current construction standards, they were assessed an additional point for system construction.

Potential Contaminant Source and Land Use

Well #1 and Well #2 rated moderate for IOCs (e.g., arsenic, nitrate), VOCs (e.g., petroleum products), SOCs (e.g., pesticides), and microbial contaminants (e.g., bacteria). The small number of potential contaminant sites (Table 1), lack of urbanization, and agricultural activity contributed to the scores.

Final Susceptibility Rating

An IOC detection above a drinking water limit, any detection of a VOC or SOC, or a detection of total coliform bacteria or fecal coliform bacteria at the wellhead will automatically give a high susceptibility rating to a well, despite the land use of the area, because a pathway for contamination already exists. Additionally, having potential contaminant sources within 50 feet of the wellhead will give an automatic high susceptibility rating.

If an automatic high rating is not received, overall system ratings are derived by equally weighting hydrologic sensitivity and system construction scores. Potential contaminant sources in the 0- to 3-year time-of-travel zone (Zone 1B) also contribute greatly to the overall ranking.

In this case, the Williamson Orchard Well #1 rated automatically high for VOCs and SOCs due to the underground fuel storage tank located within 50 feet of the well (Sanitary Survey, 2004).

Table 2. Summary of William Orchard Susceptibility Evaluation

	Susceptibility Scores[1]									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	**Final Susceptibility Ranking**			
Well		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
Well #1	H	M	M	M	M	H	H	H*	H*	H
Well #2	M	M	M	M	M	M	M	M	M	M

[1]H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility,
IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical
H* = Automatically high rating due to fuel storage tank within 50 feet of well

Options for Drinking Water Protection

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

For Williamson Orchard, drinking water protection activities should focus on ensuring compliance with the 2004 sanitary survey and minimizing spills or releases associated with the transportation corridors and waterway within the designated source water area.

Partnerships with state and local agencies and industry groups should be established and are critical to success. You may want to establish a dialog with the relevant state and local agencies related to the local roads and the canals.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus

of any drinking water protection plan. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. For areas where transportation corridors transect the delineation, the Idaho Department of Transportation should be included in protection activities. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil Conservation District, and the Natural Resources Conservation Service.

Assistance

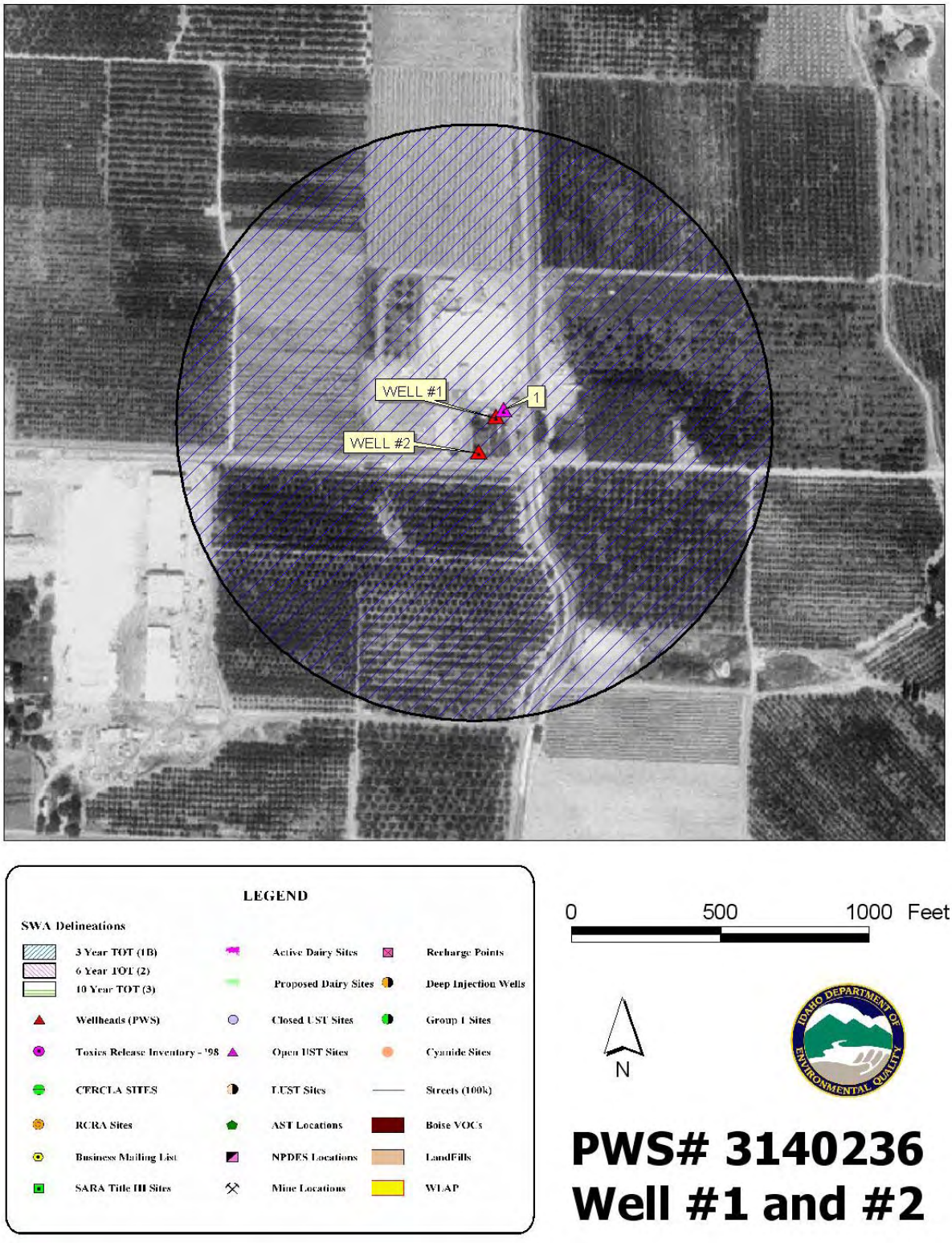
Public water suppliers and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Boise Regional DEQ Office	(208) 373-0550
State DEQ Office	(208) 373-0502

Website: http://www.deq.state.id.us

Water suppliers serving fewer than 10,000 persons may contact Melinda Harper, mlharper@idahoruralwater.com, Idaho Rural Water Association, at 208-343-7001 for assistance with drinking water protection (formerly wellhead protection) strategies.

Figure 2. Williamson Orchard Delineation Map and Potential Contaminant Source Locations



POTENTIAL CONTAMINANT INVENTORY
LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund≅ is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (IDEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by IDEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

The final scores for the susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.273)

2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.35)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

≥ 13 High Susceptibility

Ground Water Susceptibility Report Public Water System Name :

WILLIAMSON ORCHARD Well# : WELL #1

Public Water System Number 3140236

1. System Construction		SCORE
Drill Date	1/25/1910	
Driller Log Available	NO	
Sanitary Survey (if yes, indicate date of last survey)	YES	2004
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	UNK	1
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	NO	1
Well located outside the 100 year flood plain	YES	0
	Total System Construction Score	5

2. Hydrologic Sensitivity		
Soils are poorly to moderately drained	NO	2
Vadose zone composed of gravel, fractured rock or unknown	UNK	1
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	UNK	2
	Total Hydrologic Score	6

3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	IRRIGATED AGRICULTURE	2	2	2	2
Farm chemical use high	YES	2	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	NO	YES	YES	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		4	2	2	2

Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	1	1	1	1
(Score = # Sources X 2) 8 Points Maximum		2	2	2	2
Sources of Class II or III leacheable contaminants or	YES	5	2	2	
4 Points Maximum		4	2	2	
Zone 1B contains or intercepts a Group 1 Area	YES	2	0	0	0
Land use Zone 1B	Greater Than 50% Agricultural Land	4	4	4	0
Total Potential Contaminant Source / Land Use Score - Zone 1B		12(M)	8(M)	8(M)	6(M)
Cumulative Potential Contaminant / Land Use Score		2	2	2	2
4. Final Susceptibility Source Score		13(H)	13(H)	13(H)	13(H)
5. Final Well Ranking		High	Auto High	Auto High	High

Ground Water Susceptibility Report Public Water System Name :

WILLIAMSON ORCHARD Well# : WELL #2

Public Water System Number 3140236 01/11/2005

1. System Construction		SCORE			
Drill Date	2/02/1993				
Driller Log Available	YES				
Sanitary Survey (if yes, indicate date of last survey)	YES	2004			
Well meets IDWR construction standards	NO	1			
Wellhead and surface seal maintained	YES	0			
Casing and annular seal extend to low permeability unit	YES	0			
Highest production 100 feet below static water level	NO	1			
Well located outside the 100 year flood plain	YES	0			
	Total System Construction Score	2			
2. Hydrologic Sensitivity					
Soils are poorly to moderately drained	NO	2			
Vadose zone composed of gravel, fractured rock or unknown	YES	1			
Depth to first water > 300 feet	NO	1			
Aquitard present with > 50 feet cumulative thickness	YES	0			
	Total Hydrologic Score	4			
3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	IRRIGATED AGRICULTURE	2	2	2	2
Farm chemical use high	YES	2	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	NO	YES	YES	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		4	2	2	2
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	1	2	2	1
(Score = # Sources X 2) 8 Points Maximum		2	4	4	2
Sources of Class II or III leacheable contaminants or	YES	5	2	2	
4 Points Maximum		4	2	2	
Zone 1B contains or intercepts a Group 1 Area	YES	2	0	0	0
Land use Zone 1B	Greater Than 50% Agricultural Land	4	4	4	0
Total Potential Contaminant Source / Land Use Score - Zone 1B		12(M)	10(M)	10(M)	6(M)
Cumulative Potential Contaminant / Land Use Score		2	2	2	2
4. Final Susceptibility Source Score		8(M)	8(M)	8(M)	8(M)
5. Final Well Ranking		Moderate	Moderate	Moderate	Moderate